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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,258	05/10/2005	Tadashi Oshiyama	2346-0111PUS1	4981

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EXAMINER
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VU, JIMMY T

ART UNIT	PAPER NUMBER
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2821

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/06/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/06/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/534,258	<b>Applicant(s)</b> OSHIYAMA ET AL.	
	<b>Examiner</b> Jimmy T. Vu	<b>Art Unit</b> 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24,25,31 and 41 is/are allowed.
- 6) ☒ Claim(s) 22,23,26,27,29,30,32-36,38 and 40 is/are rejected.
- 7) ☒ Claim(s) 28,37 and 39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/4/07</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 23-25 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 23 and 25, lines 5 and 6, the phrase of "a ground conductor with or without an extension coil or short coil" is not clear. The term "with or without" recites to a broad range or limitation followed by linking terms and a narrow range or limitation within the broad range or limitation is considered indefinite since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired.

In claim 24, lines 4 and 5, the phrase of "a ground conductor with or without an extension coil or short coil" is not clear. The term "with or without" recites to a broad range or limitation followed by linking terms and a narrow range or limitation within the broad range or limitation is considered indefinite since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired.

In claims 40, lines 5 and 6, the phrase of "may or may not be employed, as requires" is not clear. The term "may or may not be" recites to a broad range or limitation followed by linking terms and a narrow range or limitation within the broad

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range or limitation is considered indefinite since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired.

### ***Claim Objections***

3. Claims 38 and 39 are objected to because of the following informalities:

Regarding claims 38 and 39, line 4, change "can be" to --being--.

Appropriate correction is required.

### ***Drawings***

4. New corrected drawings in compliant with 37 CFR 1.121(d) are required in this application because the figures include foreign characters. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action: A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 22, 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito (U.S. Patent 6,255,994 B1).

Regarding claim 22, Saito discloses an antenna (1) (Fig. 4) for multiple bands (see Abstract, lines 1 and 2), characterized in that one end [the end at the feeding terminal (4)] (Fig. 4) of an antenna element (2) (Fig. 4, col. 7, line 1) is electrically connected to a feeding point (feeding terminal 4) (Fig. 4), one ends (7a, 7b) of switches (7, 9) (Fig. 4, col. 7, lines 40, 58, 60) are connected respectively to at least one intermediate point (the point at 7a, 9a) (Fig. 4) and the other end of said antenna element (5, 6) (Fig. 4, col. 7, line 14), the other end of one of these switches (9b) is connected to a ground conductor directly (3) (Fig. 4, col. 7, lines 4, 15), the other ends (7b) of others of these switches are connected respectively to said ground conductor with extension coil (8) (Fig. 4, col. 7, lines 48-51) inserted in series therebetween, different electrical lengths from said feeding point (4) via said switches (7, 9) closed up to electrical connections (Fig. 4) to said ground conductor (3) [electrical connections in Fig. 4 having different electrical lengths] are set to be capable of resonating different desired frequency bands respectively [the resonant frequencies of the antenna is changed by operating of the switches (refer to Abstract), so that difference in electrical lengths/distances between the connections providing different resonant frequencies bands respectively], and resonant frequencies with which different electrical lengths of said antenna element from said feeding point up to the connections to said switches resonate are set not to come close to one of said frequency bands with which the electrical length from said feeding point up to the connection to said ground conductor

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via any other switch closed resonates [the switches is an active device so that the ON/OFF of the switches will operatively implement different resonant frequencies, which would not be closed to the frequency bands, eventhough any other switch closed resonates].

Regarding claim 29, Saito discloses an antenna (1) (Fig. 4) for multiple bands characterized in that said antenna element is formed in a meandering pattern (forming by 2B and 2Ba in Fig. 12).

Regarding claim 30, Saito discloses an antenna (1) (Fig. 4) for multiple bands characterized in that said antenna element is formed on the surfaces of a dielectric (dielectric spacer 14) (Fig. 4, col. 7, lines 2 and 3).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (U.S. Patent 6,255,994 B1) in view of Kuck (U.S. Patent 6,567,047 B2).

Regarding claim 23, Saito discloses all the claimed limitations (as disclosed in claim 22 above) except different series resonant circuits. However, Kuck discloses the different series resonant circuits (100, 102) [comprising a capacitor and a coil implemented to tune the desired range(s) of frequencies] as in Figs. 5 and 6, col. 6,

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lines 21-28. Therefore, it would have obvious to one having ordinary skill in the art at the time of the invention was made to employ the antenna of Saito with the series resonant circuits as taught by Kuck in order to operatively set up the connections between the elements and circuits in the antenna system to provide the desired ranges of frequencies [To be more specific, the series resonant circuit is electrically short circuited at the point of connection between the antenna and ground conductor so that the resonant frequencies can be set equal to the frequency bands due to the series connections of (L) and (C) in antenna structure].

9. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (U.S. Patent 6,255,994 B1) in view of Kojola (U.S. Patent 7,039,437 B2).

Regarding claims 26 and 27, Saito discloses all the claimed limitations except a matching circuit or a capacitor is inserted between the feeding point and one end of the antenna. However, Kojola discloses a matching circuit (26) or capacitor (76) (Fig. 7, col. 4, lines 34-35). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the antenna of Saito with the matching circuit or capacitor as taught by Kojola for inserting between the feeding point and one end of the antenna in order to provide impedance matching within the multiple bands so that the frequency bands be wide frequency bands.

10. Claims 32-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (U.S. Patent 6,255,994 B1) in view of Gamalielsson (U.S. Patent 6,388,626 B1).

Regarding claims 32-33, Saito discloses the antenna for multiple bands characterized in that the ground conductor is formed in an approximate rectangle [ground conductor (3) is a rectangle in Fig. 4] on a flat substrate [dielectric spacer (14) in Fig. 4, col. 7, lines 3-8], antenna element (2) (Figs. 1 and 4) is formed on the substrate (14) separated from the conductor (3) [as refer to Figs. 1 and 4].

Saito does not disclose the antenna element bordering on one short side of the rectangular ground conductor.

However, Gamalielsson teaches the antenna element (1a, 1b) (Figs. 4 and 5, col. 3, line 41) bordering on one short side [front side of ground plane (6) in Figs. 4 and 5] of the rectangular ground conductor [ground plane (6) in Fig. 5, col. 3, lines 65-67].

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the antenna of Saito with the antenna element bordering on one short side of ground conductor as taught by Gamalielsson in order to have a good achievement of frequencies in operation of antenna structure.

Regarding claims 34 and 36, Saito discloses the antenna for multiple bands characterized in that the ground conductor is formed in an approximate rectangle [ground conductor (3) is a rectangle in Fig. 4] on a flat substrate [dielectric spacer (14) in Fig. 4, col. 7, lines 3-8], antenna element (2) (Figs. 1 and 4) is formed on the substrate (14) separated from the conductor (3) [as refer to Figs. 1 and 4].

Saito does not disclose one part forming in a meandering pattern and turned around repeatedly in parallel to the long sides of the ground conductor, and one part



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forming in a meandering pattern and turned around repeatedly in parallel to the shorts sides of the ground conductor.

However, Gamalielsson teaches the meandering pattern antenna (meander radiating elements (1a, 1 b) (Fig. 6, col. 4, lines 33-41) turned around repeatedly in parallel to long/short sides (Fig. 6) of the ground conductor (6) (Fig. 6).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the antenna of Saito with the meandering patterns turned around repeatedly in parallel to long/short sides of the ground conductor as taught by Gamalielsson in order to operate the radiating elements (meander patterns) to be tuned to different resonant frequencies for achievement the multiple bands in the antenna system.

11. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (U.S. Patent 6,255,994 B1) in view of Warnagiris (U.S. Patent 5,754,143).

Regarding claim 38, discloses the antenna for multiple bands characterized in that one end [the end at the feeding terminal (4)] (Fig. 4) of an antenna element (2) (Fig. 4, col. 7, line 1) is electrically connected to a feeding point (feeding terminal 4) (Fig. 4), one ends (7a, 7b) of switches (7, 9) (Fig. 4, col. 7, lines 40, 58, 60) are connected respectively to at least one intermediate point (the point at 7a, 9a) (Fig. 4) and the other end of said antenna element (5, 6) (Fig. 4, col. 7, line 14), the other end of one of these switches (9b) is connected to a ground conductor directly (3) (Fig. 4, col. 7, lines 4, 15),

Saito does not disclose wherein the antenna element is formed in a meandering pattern along an imaginary circular cylinder plane and one end, the other end and the intermediate point of the antenna element are positioned so that they being connected to and disconnected from the feeding point and the switches.

However, Warnagiris discloses meandering pattern (meander sections of antenna 101) (Fig. 3A-3D, col. 4, lines 51-56) fold into the cylindrical form; and the positions of one end (terminal 42) (Fig. 1, col. 4, line 48), the other end (44) (Fig. 1), an intermediate point [the point(s) connecting the path (32, 32') (Fig. 1) to the switch (30) (Fig. 1)] of the antenna element, and feeding point (43) (Fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the antenna of Saito with the meandering pattern in cylindrical form, and the positions of the ends and intermediate point of the antenna element being connected to and disconnected from the feeding point and the switches as taught by Warnagiris in order to reduce overall antenna size while retaining radiation efficiency, and easily access and reduce required runs of the switch control lines.

***Allowable Subject Matter***

12. Claims 24, 25, 31, 40 and 41 are allowed.
13. Claims 28, 37 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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**Conclusion**

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy T Vu whose telephone number is (571) 272-1832. The examiner can normally be reached on M - F: 9 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on (571) 272-1662. The fax phone

numbers for the organization where this application or proceeding is assigned are (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2800.

Jimmy Vu

March 21, 2007

*Douglas W. Owens 4/2/07*

DOUGLAS W. OWENS  
SUPERVISORY PATENT EXAMINER